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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,933	02/27/2004	Suning Tang	Nano LC Device	9537
7590 08/09/2005			EXAMINER	
CHARLES QIAN 1018 CRANBERRY DR. CUPERTINO, CA 95014			NGUYEN, THANH NHAN P	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/788,933	Applicant(s) TANG, SUNING	
	Examiner (Nancy) Thanh-Nhan P. Nguyen	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/27/2004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

Claim 20 is objected to because of the following informalities: Claim 20 currently read as, "The method recited in claim 14 wherein the said the said..." It appears it should have read as, "The method recited in claim 14 wherein the said..."

Appropriate correction is required.

Claim 23 is objected to because of the following informalities: Claim 23 currently read as, "... 1 micrometers..." It appears it should have read as, "... 1 micrometer..."

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 6, 8-9, 11-12, 14, 18, 20, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Sutherland et al (U.S. 2005/0099662 A1).

Referring to claim 14, Sutherland et al discloses a method for providing optical phase delay comprising the following steps: using a collimated light source (system 62,

64, 66) having specific wavelength; passing the input light to an electrically tuned liquid crystal nano-structure consisting of alternating polymer and liquid crystal regions (PDLC 50); applying electrical voltages to electrodes (coated on 52a, 52b) near the said liquid crystal nano-structure to tune the said optical phase delay, [fig. 5; abstract].

Referring to claim 18, Sutherland et al discloses wherein the liquid crystal regions containing liquid crystal materials, [abstract].

Referring to claim 20, Sutherland et al discloses wherein the electrodes being fabricated with electrically conductive materials such as ITO, [par. 0117].

Referring to claim 22, Sutherland et al discloses wherein the polymer regions having separations measuring from 1 to 1000 nanometers (nanometer-size), [abstract].

Referring to claim 11, Sutherland et al discloses the said cover plate being optically coupled to at least one prism (70), [fig. 5].

Claims 1-2 are met the discussion regarding claim 14 rejection above.

Claim 6 is met the discussion regarding claim 18 rejection above.

Claim 9 is a product-process-claim. According to MPEP 2113, in this case, the process is not given any weigh, and therefore, claim 9 will be treated as a product claim itself. Therefore, claims 8-9 are met the discussion regarding claim 20 rejection above.

Claim 12 is met the discussion regarding claim 22 rejection above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sutherland et al in view of Wang (U.S. 5,270,843).

Referring to claims 15-16, Sutherland et al lacks disclosure of the said liquid crystal regions having an ordinary refractive index n_o and an extraordinary refractive index n_e , and the said polymer regions having an index of refraction n_p .

It was well known that those refractive indices of liquid crystal regions and polymer regions were for determining the light passes through the liquid crystal display with either scattering or transmitting, as evidenced by Wang, [figs. 1-2; col. 3, lines. 59-68; col. 4, lines 1-22]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to disclose the said liquid crystal regions having an ordinary refractive index n_o and an extraordinary refractive index n_e , and the said polymer regions having an index of refraction n_p for determining the light passes through the liquid crystal display with either scattering or transmitting.

Claims 3-4 are met the discussion regarding claims 15-16 rejection above respectively.

Claims 5, 7, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sutherland et al in view of Hisamitsu et al (U.S. 2002/0008837).

Referring to claims 17 and 19, Sutherland et al lacks disclosure of the said polymer regions and liquid crystal regions being fabricated through a photolithography

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method using patterned phase masks and/or using holographic two beam interference methods.

It was conventional at the time to have polymer regions and liquid crystal regions being fabricated through a photolithography method using patterned phase masks, and therefore had the benefits associated with being conventional, such as the benefit of being available and the benefit of being suitable for the intended purpose, as evidenced by Hisamitsu et al, [pars. 0098-0099]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have polymer regions and liquid crystal regions being fabricated through a photolithography method using patterned phase masks for the benefit of being available and the benefit of being suitable for the intended purpose.

Claims 5 and 7 are met the discussion regarding claims 17 and 19 rejection above respectively.

Claims 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sutherland et al in view of Wu et al (U.S. 6,441,875).

Referring to claim 21, even though Sutherland et al lacks disclosure of the liquid crystal regions being optically coupled to at least one polarization beam splitters. It was well known to use polarization beam splitters liquid crystal display for the benefit of improving the efficiency of utilization of light source, as evidenced by Wu et al, [col. 1, lines 28-35]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the liquid crystal regions being optically

coupled to at least one polarization beam splitters for the benefit of improving the efficiency of utilization of light source.

Claim 10 is met the discussion regarding claim 21 rejection above.

Claims 13 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sutherland et al in view of Lavrentovich et al (U.S. 6,897,915).

Referring to claim 23, Sutherland et al lacks disclosure of the said cover plates having a separation distance of 1 micrometer to 500 micrometers. However, it was conventional at the time to have the said cover plates having a separation distance of 1 micrometer to 500 micrometers, and therefore had the benefits associated with being conventional, such as the benefit of being available and the benefit of being suitable for the intended purpose, as evidenced by Lavrentovich et al, [col. 6, lines 62-63]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have of the said cover plates having a separation distance of 1 micrometer to 500 micrometers for the benefit of being available and the benefit of being suitable for the intended purpose.

Claim 13 is met the discussion regarding claim 23 rejection above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Sutherland et al (U.S. 2005/0099662 A1).

Wang (U.S. 5,270,843).

Hisamitsu et al (U.S. 2002/0008837).

Lavrentovich et al (U.S. 6,897,915).


Wu et al (U.S. 6,441,875).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to (Nancy) Thanh-Nhan P. Nguyen whose telephone number is 571-272-1673. The examiner can normally be reached on M-F/9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

(Nancy) Thanh-Nhan P Nguyen
Examiner
Art Unit 2871
-- August 5, 2005 -- *TN*


DUNG T. NGUYEN
PRIMARY EXAMINER